

HARMFUL CYANOBACTERIA AND ALGAL BLOOMS

PUBLIC HEALTH ISSUE

Cyanobacteria (formerly known as blue-green algae) are a diverse group of photosynthetic bacteria, naturally found at low levels in all lakes. Under certain conditions, they can grow to densities forming a bloom, and the resulting group of cyanotoxins can pose a threat to human, pet, and wildlife health. Common symptoms associated with acute exposure to cyanotoxins can range from mild to severe and include dermal, eye and nose irritations, general malaise, and a fever. Gastrointestinal symptoms or Gastroenteritis, can include nausea, vomiting, and diarrhea. Neurological symptoms can include tingling, numbness and seizures. In the most severe cases, nervous system failure, organ failure, or death can occur. The primary route of exposure to cyanotoxins is through ingestion. This can be a combined exposure from drinking water, food sources, or unintentional ingestion via swimming. Children and immune-compromised individuals are more likely to have health risks from cyanotoxins. Animals, including domestic animals and livestock, are at greater risk to cyanotoxins because they are more likely to drink the water and be exposed to a higher amount of toxins.

ROLE OF THE NHDES HARMFUL ALGAL AND CYANOBACTERIAL BLOOM PROGRAM

The [NH Department of Environmental Services' \(NHDES\) Harmful Algal and Cyanobacterial Bloom Program](#) (HAB) coordinates monitoring, public communication and educational outreach efforts in regard to cyanobacterial blooms. They will sample suspected blooms and issue a lake warning if concentrations are elevated. NHDES will continue to monitor the water and notify appropriate town officials, health officers, lake association members, and any other identified community members with results of subsequent testing.

ROLE OF THE LOCAL HEALTH OFFICER

In response to a suspected algal bloom in your community, the health officer:

- May assist NHDES in coordination of sampling and resampling efforts;
- May post cyanobacteria advisory signs at entrances of public access points and along the shoreline of an impacted waterbody;
- May help communicate and distribute NHDES cyanobacteria advisories postings;
- May encourage individuals to avoid contact with water during cyanobacteria advisories;
- May discuss impact of cyanobacteria advisories or alerts with concerned citizens, or direct them to the NHDES program staff (HAB@des.nh.gov); and
- May encourage local actions to reduce cyanobacteria blooms.

LAWS AND REGULATIONS

[Env-Wq 1108.14 - Public Bathing Places](#): NH Administrative rules that state that:

(e) The **owner shall** post a cyanobacteria advisory whenever a cyano-bacteria scum is present in the bathing area that is dominant and represents more than 50% of the algal cell count or the total cell count of the cyanobacteria at the beach is greater than 70,000 cells/milliliter (mL) of water.

What is a Cyanobacteria Bloom?

Although naturally occurring in most NH lakes, under certain circumstances, cyanobacteria can become dense along the shorelines to form surface water “blooms”. Cyanobacteria spend most of their life cycle suspended throughout all depths of the lake. Research indicates that cyanobacteria abundance increases as lake nutrients increase. Increased nutrients (phosphorus and nitrogen) in waterbodies and climate change are two major contributing factors in the growth of cyanobacteria in freshwater ecosystems. Although most blooms are reported in the summer, they can also be reported into the fall.

What Does a Bloom Look Like?

Blooms are visually diverse, presenting in many ways depending on the type of cyanobacteria present. They are usually blue-green in color but can also appear as bright green, yellow, or white streaks, flecks, or clouds on the surface or throughout all the depths of the lake. Cyanobacteria blooms can be dynamic events, moved around by wind, waves, and boat action. [Learn more here.](#)

REPORTING A CYANOBACTERIA BLOOM

Suspected cyanobacteria blooms should be reported to NHDES by calling (603) 848-8094 or emailing HAB@des.nh.gov. The report should include the reporter’s full name and contact information, the waterbody name, town, specific location of the bloom, description of severity, photos, date, and time the bloom was observed.

Health officers can take a sample of the suspected bloom and deliver it to the NHDES lab in Concord. Sample collection and delivery instructions are included at the end of this document.

If no community member or town representative is available to sample and deliver, a NHDES staff member will sample the suspected bloom, typically within 24 hours. Sampling is performed at public access points or at residences if permission is given to access through a personal property. NHDES is restricted to shoreline sampling for this program, however we accept samples taken from a boat if collected by a collaborator. The public is advised to not wade, swim, or drink the water, and to keep pets and livestock out until sampling results are available.

If the bloom is occurring on a waterbody used as a source of drinking water, consult with [NHDES’ CyanoHAB Response Protocol for Public Water Supplies.](#)

Cyanobacteria Advisories

An advisory is a lake wide warning that the water is currently unsuitable for wading or swimming. When a waterbody has an advisory, children and pets should especially be kept out of the water as they are more vulnerable to cyanotoxin exposure. Advisories are based only on cell counts (not

toxin analysis) and are intended as a precautionary measure for short-term exposure to cyanotoxins. Advisories are issued lake wide, not at specific locations on a waterbody, as concentrated bloom material can move around a waterbody from hour to hour. Weekly resampling is completed if an advisory is issued. The advisory is removed if the cell count declines to below the recreational threshold, and after a suitable amount of time has passed (more time is allowed for very high densities).

An advisory is issued if the cell density of the sample exceeds the state's recreational limit of 70,000 cells/milliliter (mL). Alerts can be issued if:

- the results are below the recreational threshold, but if a bloom has the potential to develop;
- a sample cannot be collected and reviewed within 24 hours (e.g., if a bloom is reported on a Friday afternoon) **and** photographic evidence of the bloom is provided

When a cyanobacteria advisory is issued, NHDES will communicate to the town officials, Health Officers, lake association members, and any other identified community members associated with the impacted waterbody. The Health Officer can be asked to post advisory signs at public access points on the waterbody. If communities need advisory signs, signs can be obtained by emailing HAB@des.nh.gov identifying how many are requested. In addition to physical signs at public access points, an online [Advisory Mapper](#) is updated with current advisories. Individuals can also receive official statements about advisories from NHDES by signing up for Beach Advisories and Press Releases via [NHDES's email list](#). Information about advisories is also posted on the NHDES general social media platforms during the summer season.

When an Advisory is Issued

NHDES advises lake users to avoid contact with the water in areas experiencing elevated cyanobacteria cell counts. Visual assessments of the water should always be performed prior to recreation or allowing pets in waterbodies. If a suspected illness in association with potential cyanotoxin exposure has occurred for a human or pet, report that information to the NHDES through the [Beach-Related Illness form](#). The history of cyanobacteria advisories and other water quality data for waterbodies across the state can be found on the [Lake Information Mapper](#). This resource is updated annually in the winter to reflect the most recent year's advisory information.

Additional Resources

[Managing Phosphorous In Lakes](#)

[Cyanobacteria Monitoring Collaborative](#)

CONTACT INFORMATION

NHDES Harmful Algal Bloom Program

Kate Hastings, Program Manager

603-848-8094

hab@des.nh.gov (reporting and correspondence about cyanobacteria events)

<https://www.des.nh.gov/water/healthy-swimming/harmful-algal-blooms>

Cyanobacterial Sample Collection Instructions

Sample Collection Instructions

As a reminder, these blooms are potentially toxic, so please take the necessary precautions – gloves and a mask, and wash your hands well with freshwater when done.

- Label a sample jar (clean glass or hard plastic jars are best)
 - Sampler's name and contact information (phone number and email)
 - Waterbody Name and Town
 - Address
 - Sample description (i.e., “worst part of bloom”, “surface skim”, “nearshore”, “town beach”)
 - Date and time
- Collect a sample by skimming the bottle on the surface of the water to sample the most concentrated part of the bloom, or scooping clumps of the concentrated material
- Rinse bottles off if bloom residue covers the outside of the bottle
- Wash hands after handling bloom material
- Place sample on ice or in a refrigerator until it is delivered to the Concord NHDES lab or picked up by NHDES

Sample Drop off Location

- NHDES 29 Hazen Drive, Concord NH
- There is a black bin outside the NHDES office at the DMV facing entrance labeled "Cyanobacteria Sample Drop Off"
- Coordinate with Kate Hastings (603-848-8094) when samples will be delivered
- Confirm sample drop off by texting 603-848-8094

Sample Drop off Hours

- Monday through Thursday 8:00 am – 3:00 pm, Friday 8:00 am – 11:00 am